



UNIVERSITI
TEKNOLOGI
MARA

**MOLECULAR IDENTIFICATION OF LACTIC ACID BACTERIA ISOLATED
FROM *TEMPOYAK* MADE OF MALAYSIAN *DURIAN MUSANG KING*, *BUDU*
AND *FERMENTED CHILI***

By

MUHAMAD NAZMIE BIN RAHMAD

**Thesis Submitted in Partial Fulfillment of the Requirements for
Bachelor of Medical Laboratory Technology (Hons),
Faculty of Health Science, Universiti Teknologi MARA**

2015

DECLARATION

I, hereby declare that this thesis is my original work and has not been submitted previously or currently for any other degree at UiTM or any other institutions.

A handwritten signature in black ink, appearing to read 'Nazmie', is written over a horizontal dotted line.

(Muhamad Nazmie Bin Rahmad)

TABLE OF CONTENT

	PAGE
TITLE PAGE	i
DECLARATION	ii
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	vii
ABSTRACT	ix
 CHAPTER	 PAGE
1 INTRODUCTION	
1.1 Background of the study	1
1.2 Problem statement	2
1.3 Research Objectives	3
1.4 Research hypothesis	3
1.5 Significant of study	4
2 LITERATURE REVIEW	
2.1 Traditionally fermented food	5
2.1.1 <i>Budu</i>	5
2.1.2 <i>Tempoyak</i>	6
2.1.3 Fermented Chili	7
2.2 Lactic Acid Bacteria	7
2.3 The usage of Lactic Acid Bacteria	9
2.4 Bacteriocin	10
2.5 Molecular characterization	12
2.5.1 Polymerase chain reaction (PCR)	12
2.5.2 Electrophoresis	12
2.5.3 DNA Sequencing	13
3 MATERIALS AND METHODS	
3.1 Laboratory Equipment	15
3.1.1 Instruments	15
3.1.2 Materials	15
3.1.3 Sample	16
3.1.4 Media Culture	16
3.1.5 Chemical and Reagents	16
3.1.6 Microbial Strain	16
3.2 Methods	18
3.2.1 Isolation of lactic acid bacteria, LAB	18

ABSTRACT

MOLECULAR IDENTIFICATION OF LACTIC ACID BACTERIA ISOLATED FROM TEMPOYAK MADE FROM MALAYSIAN *DURIAN MUSANG KING*, *BUDU* AND FERMENTED CHILI

Malaysia has many traditional fermented food and every states in Malaysia have their own traditional food for example like Budu, Tempoyak and Chili Bo. Lactic acid bacteria (LAB) are an important group of industrial organism that involved in the processing of various fermented food. Previous study shown, screening and identification of lactic acid bacteria is only focus on biochemical and analytical profile index (API) test. Therefore, this study was performed to investigate the LAB isolate made from durian musang king, budu, and fermented chili using molecular identification which is PCR analysis. The sample was sequenced by 16S rDNA gene and will detect the specific bacteria strain of lactic acid bacteria due to the percentage of similarities according to sequence data accumulated from the National Center of Biotechnology Information database (NCBI) Gen Bank. Based on data collected, LAB strain was detected at 1500 base pair. The sequencing result were identified the specific strain of LAB isolated according to the high similarities percentage. Comparison between PCR and API test was done showing that PCR are given more specific strain of LAB isolated. As a conclusion, there is a LAB strain isolated from durian made of Malaysian durian musang king, budu and chili bo. Detection by PCR gives exact strain of LAB by PCR compare to API test.

Keywords: Lactic acid bacteria, PCR, 16S rDNA, API,

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Country like Malaysia has many traditional foods, where every state in Malaysia has their own traditional food for the example is *Budu*. *Budu* is an originating and consume usually people from East Coast state of Peninsular Malaysia such as Kelantan and Terengganu.

Lactic acid bacteria (LAB) are a group of bacteria that produce lactic acid from the product of the carbohydrate fermentation (Hajar & Hamid, 2013). The application of LAB is widely used for example it is use in the food industry as the natural preservatives. Other than that, the ability of LAB that can form a product of antimicrobial compound that can against pathogen which they act as natural barrier and also the spoilage of food that cause by the efficient bacterial agents that has been proven. Besides that, the usage of LAB and metabolic product has been generally conceive as safe (Zacharof & Lovitt, 2012). Nowadays, LAB has been choose to be used or become a concern to a consumers because the ability as bio preservative to replace the chemical preservative due to awareness toward food preservatives usage (Kormin & Rusul, 2001).

Former study was shown before this that screening of lactic acid bacteria are mainly focus on biochemical test. The common biochemical test apply for screening lactic acid bacteria are gram staining, catalase test, oxidase test, methyl red (MR), Voges Proskauer (VP), and sugar fermentation test according to Chowdhury, (2012). Other than that, analytical profile index (API) also has been us to detect LAB, API test also one of the biochemical test. The method play by API is based on microorganism or bacteria fermentation pattern. For the LAB identification, the API strip that had been